

BOOK REVIEWS

This book may be likened to a review article, only the author, not being limited by the 50-page upper limit on reviews, was able to present a more complete summary of the work he covered.

HAROLD J. NOROWITZ

THE STRUCTURE OF NUCLEIC ACIDS AND THEIR ROLE IN PROTEIN SYNTHESIS. Biochemical Society Symposia, Number 14. E. M. Cook, Ed. New York, Cambridge University Press. 1957. 74 pp. \$3.75.

This is the fourteenth of a series of Biochemical Society Symposia published annually. There has been an unfortunate delay in publication since the Symposium was held on February 18, 1956 and the book was not published until May 22, 1957.

A brief historical introduction to the morning session by N. W. Pirie touches on a variety of subjects from the unfounded assumptions made in nucleic acid research to the relationship between terminology and biological entity. R. Markham gives a very good and concise review of the structure of nucleic acids, and indicates the improbability of chain branching in RNA although more flexible views on this topic have also been published. M. H. F. Wilkins presents experimental data concerning the structure of DNA which are in accord with the Watson and Crick model, and discusses in an interesting manner the types of structural combinations of DNA with protamine and histone.

The afternoon session is introduced by J. N. Davidson who gives an excellent thumbnail sketch of the cytological aspects of the interrelationship of nucleic acids and protein synthesis. He mentions the increasing volume of evidence that RNA is involved in protein synthesis while DNA may be involved in the synthesis of certain specific proteins.

B. A. Askonas, J. L. Simkin, and T. S. Work present a survey of the literature bearing on the interrelationship between nucleic acid and protein synthesis. They point out the difficulties inherent in accepting nucleic acids as templates in the synthesis of proteins and suggest that patternization could be controlled through the influence of small nucleotides on reaction rates. E. F. Gale reviews the literature on amino acid incorporation by subcellular preparations from different sources with particular emphasis on the work from his laboratory. Gale has published a similar but more extensive review in the Harvey Lectures of 1956.

K. Burton presents a very comprehensive review of the topic in relation to bacteriophage multiplication. In this relatively simple biological system, in terms of participating components, the connection between DNA and protein synthesis can be shown more clearly.

This book brings to the foreground the facts as well as the hypotheses current in this field. Although there is appreciable evidence for a relationship between nucleic acids and protein synthesis, it may be that this does not present a cause-effect relationship but rather a co-occurrence of biological phenomena which are not directly related. For instance, it appears to be a fact that bacteria require a complete amino acid mixture for bacteriophage-DNA synthesis, but the interpretation, rather than being

one of a template synthesis, may well be that a limited number of enzymes necessary for the synthesis of the DNA have to be synthesized. Once adequate amounts of these enzymes have been synthesized, DNA synthesis may then proceed without any further protein synthesis. (This amount of protein synthesis may represent a small percentage of the total protein synthesis and may not be completely inhibited by chloramphenicol.)

Regardless of the interpretation of the experimental results, this book presents an excellent summary of the pertinent literature as well as uninhibited discussions by competent investigators of the type which usually do not find their way into print. The book is highly recommended, not only to investigators directly interested in the field, but also to more generally oriented graduate students and biologists who wish to be familiar with recent developments in a rapidly advancing field.

E. S. CANELLAKIS

THE MICROBIAL WORLD. By Roger Y. Stanier, Michael Doudoroff, and Edward A. Adelberg. Englewood Cliffs, New Jersey, Prentice-Hall, Inc., 1957. xxii, 682 pp. \$8.00.

In the preface to this new text on microbiology the authors declare: "Microbiology was for a long time very largely an applied science, empirical in outlook, and isolated from the mainstreams of biological thought." With but few exceptions, the textbook literature of microbiology amply testifies to the accuracy of this statement. The applied specialties have not only dominated textbook writing in number but in content. The classical introductory volume in microbiology consists of a few perfunctory chapters on microbial taxonomy and physiology, an arithmetical summary of the population dynamics of *Escherichia coli* in the test tube, followed by chapters on the microorganisms that fix nitrogen, cause disease, ferment sugar to alcohol, lurk in milk and water, and, perhaps, put holes in cheese. The recent rebellion against this form has tended, unfortunately, to exaggerate the molecular approach, resulting in attempts to condense a generous portion of physical and biological chemistry into a microbiology text.

It is against this background that *The Microbial World* stands out so brilliantly. This work is a clearly written and well-illustrated introduction to the *biology* of microorganisms. The first and major portion of the book establishes the range and diversity of microorganisms, proceeds with an extended account of their anatomy and physiology, their myriad biochemical activities, and concludes with what is probably one of the few stimulating discussions available of the problems of microbial classification. Stressed constantly by the authors is the profit derived from the application of genetics and evolution to microbial problems, and, in turn, the contribution made to these universal biological themes by studies in microbiology. With this fund of information now made available to the reader, part two of the book explores the mutual relations between microorganisms and their environment in a far more satisfactory manner than the mere compilation of what microorganisms do and do not do.